



Health in Rural Missouri

The Economic Impact of Critical Access Hospitals

Table of Contents

Data Sources	2
Introduction	3
CAH Distribution	4
Critical Access Employment Data	5
Overview of Economic Impact Analysis	6
Multiplier Effect	6
Output	7
Calculating Economic Impact of Missouri CAHs	8
Labor and Income Impact	9
Total Value Added Impacts	9
Missouri CAH Multipliers and Impacts	10
In Conclusion	11
Sources	12

Data Sources³

- Data for this report were derived using Impact Analysis for Planning Software (IMPLAN).
- IMPLAN uses multiple data sources in varying forms to calculate multipliers and run analyses.
- IMPLAN data sources are listed in figure 1.
- IMPLAN adds value to available data by:
 - ▶ Providing estimates for non-disclosed data
 - ▶ Providing estimates for non-census years
 - ▶ Providing estimates at a finer geographic scale (i.e., at the local level)
 - ▶ Providing inter-county trade flow data, which allows Multi-Regional I/O analysis
 - ▶ Reconciliation of multiple data sources
 - ▶ Bringing it together in consistent format

Figure 1. IMPLAN Data Sources³

IMPLAN Data Sources
North America Industry Classification System
Census County Business Patterns (CBP)
U.S. Bureau of Economic Analysis (BEA)
BEA Regional Economic Accounts (REA)
Bureau of Labor Statistics (BLS)
BLS Covered Employment and Wages (CEW)
BLS Quarterly Census of Employment and Wages (QCEW)
BLA Consumer Expenditure Survey (CES)
National Income and Product Accounts (NIPA)



Introduction

There is a strong correlation between health care and the economy in many rural areas.⁶ Health care facilities not only provide health services, they also provide jobs, business and industry growth and attraction of certain demographics, specifically retirees.⁵

Health care facilities create employment opportunities directly and indirectly. The presence of good health care is crucial to industry and business leaders when selecting a location for their business. In addition, the majority of retirees list having access to healthcare as a top priority in choosing a location to live.⁵

As of February 2016, Missouri had 37 Centers for Medicare and Medicaid Services designated as Critical Access Hospitals (CAH).^{1,2}

In order to be designated as a CAH, the facility must:

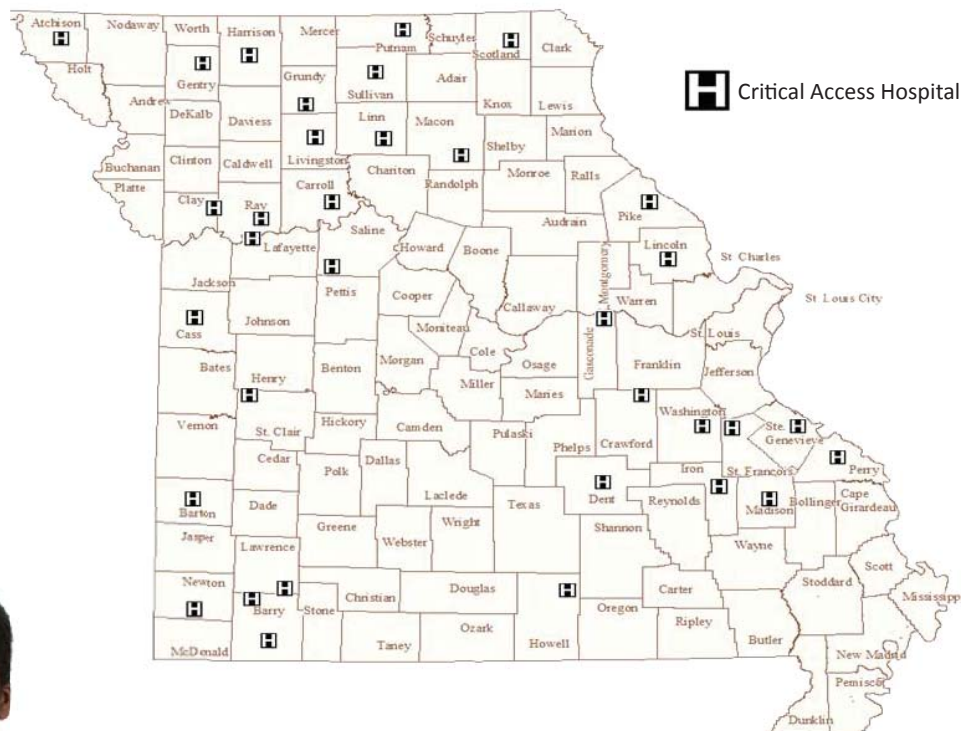
- Have 25 or fewer acute care inpatient beds
- Located more than 35 miles from another hospital
- Maintain an annual average length of stay of 96 hours or less
- Provide 24/7 emergency care services¹⁰

Not only are these hospitals crucial in providing timely and convenient health care for rural Missourians, they also provide economic stability. CAHs are often the largest or second largest employer in a community.⁵ There is variability in the financial sustainability of CAHs nationwide, leaving some of them vulnerable to closure. Closing CAHs results in health care disparities and economic decline. When CAHs close, many people lose their jobs leaving them unable to contribute to the economy; tourism decreases; people relocate for better employment opportunities and to be closer to healthcare; the location is no longer a retiree destination, etc.⁵ This report highlights the economic effect Missouri CAHs have on their community.

CAH Distribution⁸

Figure 2. Missouri CAH Distribution⁸

Figure 2 is a map of the geographical distribution of CAHs in Missouri. A complete list of the CAHs and counties are on page 7.



Not only are these hospitals crucial in providing timely and convenient health care for rural Missourians, they also provide economic stability.

Rural Health



Critical Access Employment Data³

- Employment data was available for 32 of Missouri's 37 CAHs.
- The employment range for the 32 CAHs is between 64 and 462 full and part time employees.
- Cass Regional Medical Center in Cass County has the highest.
- The average number of employees is 226.
- The 5 counties with the lowest number of CAH employees are listed in Figure 3.
- The 5 counties with the highest number of CAH employees are listed in Figure 4

Figure 3. Counties with Lowest CAH Employment, 2014³

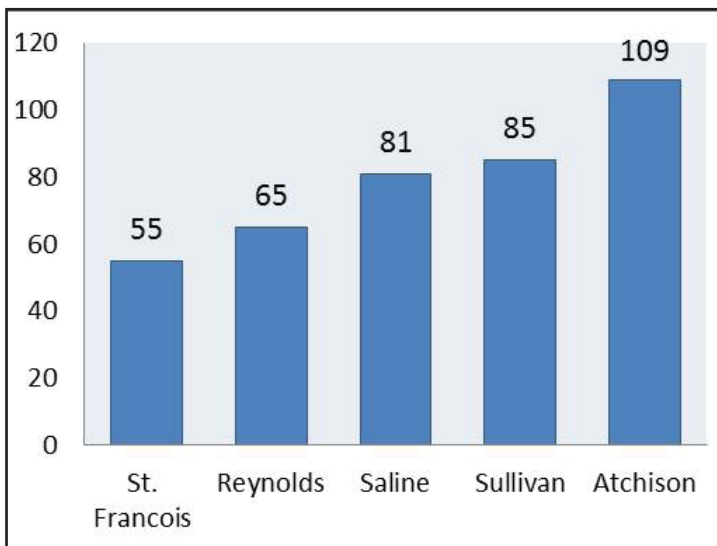
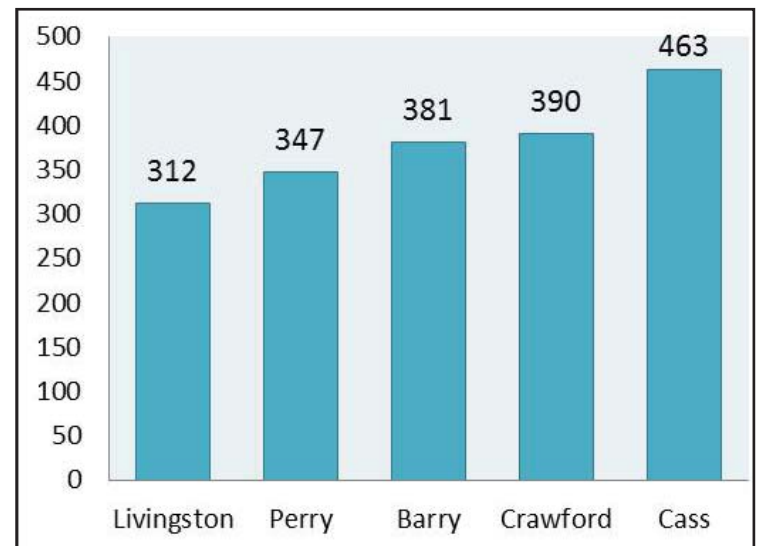


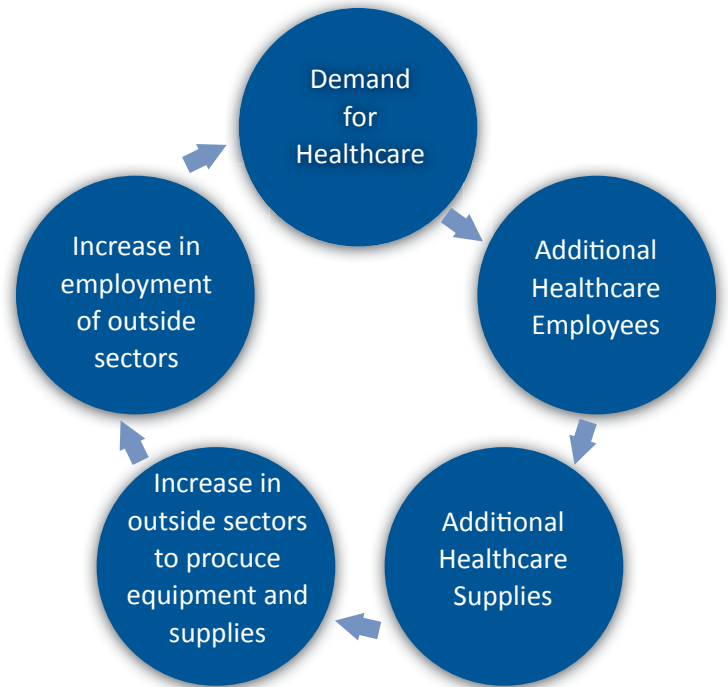
Figure 4. Counties with Highest CAH Employment, 2014³



Overview of Economic Impact Analysis

- The economic impact of CAHs on rural Missouri was calculated using an Input/Output model (I/O). (Figure 5)³
- Input/Output analysis measures the circular behavior of the economy.³
 - ▶ For example: A demand for health services requires more equipment, more labor, and more supplies, which in turn, requires more labor to produce the supplies. In addition, closing a hospital results in a decreased demand of all these factors and a decrease in economic activity.
- Economic calculations are derived using five sets of multipliers which measure the effects created by an increase or decrease in economic activity.³
- These 5 multipliers are; total industry output, personal income, total income, value added, and employment.³

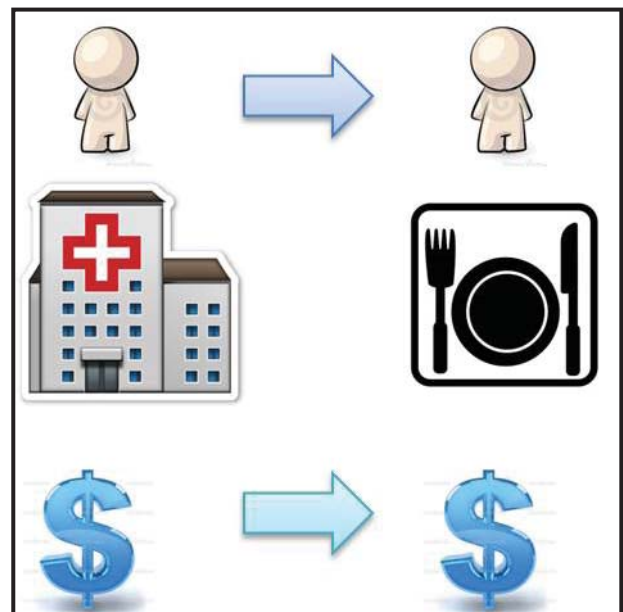
Figure 5. Healthcare Input/Output Model³



Multiplier Effect

- Multiplier examples: (Figure 6)
 - ▶ An employment multiplier of 2.0 indicates that if 1.0 job is created by a new industry (directly) 1.0 additional job is created in other sectors due to business and household spending (indirectly).⁴
 - ▶ An income multiplier of 1.70 means that for each dollar of wages paid to a hospital employee, another \$0.70 of wages and salaries are generated in another business in the county.⁴

Figure 6. Multiplier Effect⁴



The total impact of change in an economy consists of direct, indirect, and induced changes.⁴

- ▶ Direct impact- changes in the activity of the focus industry (CAH)⁴
- ▶ Indirect Impact- The effect of local industries buying goods and services from other local industries⁴
- ▶ Induced Changes- the effect of the changes in household consumption on business in a community⁴

Output

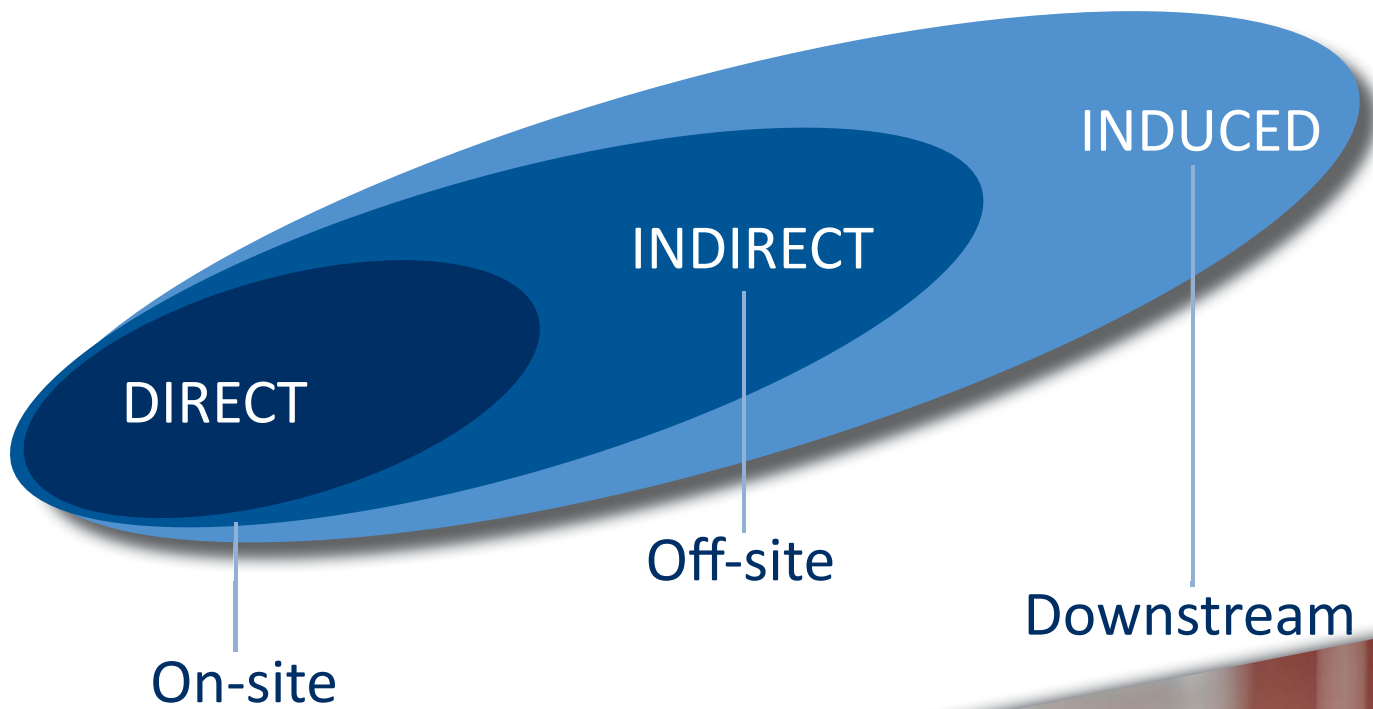
The total output is the total economic value of hospital production per year in the local economy.⁴ The average for all 24 CAHs with available data is \$30,266,271. Individual CAHs, CAH county, and total output are listed in Figure 7. Parkland Health Center in St. Francois has the lowest generated total output at just over 7 million, and Cass Regional Medical Center had the highest generated total output for 2014 at approximately \$64 million.³ The total output is used in calculations of total impact on a community which includes, wages, employment counts, and consumer spending; both directly and indirectly.

Figure 7. Total Output of Missouri Critical Access Hospital, 2014³

Critical Access Hospital	County	Total Output
Community Hospital-Fairfax	Atchison	\$13,469,351.48
Cox Monet & Mercy Hospital Cassville	Barry	\$34,786,615.45
Carroll County Memorial Hospital	Carroll	\$21,496,721.03
Cass Regional Medical Center	Cass	\$64,080,378.06
Cedar County Memorial Hospital	Cedar	\$23,038,270.60
Missouri Baptist Sullivan Hospital	Crawford	\$51,124,904.53
Salem Memorial District Hospital	Dent	\$31,990,604.92
Northwest Medical Center	Gentry	\$24,145,650.82
Wright Memorial Hospital	Grundy	\$23,119,844.43
Mercy St. Francis Hospital	Howell	\$16,448,685.66
Lafayette Regional Health Center	Lafayette	\$31,297,658.49
Mercy Hospital Aurora	Lawrence	\$31,708,459.02
Mercy Hospital Lincoln	Lincoln	\$56,767,318.62
Pershing Memorial Hospital	Linn	\$21,326,293.53
Hedrick Medical Center	Livingston	\$42,196,927.72
Samaritan Hospital	Macon	\$42,803,827.02
Freeman Neosho Hospital	Newton	\$35,911,058.67
Perry County Memorial Hospital	Perry	\$42,695,018.55
Pike County Memorial Hospital	Pike	\$34,212,595.21
Southeast Health Center of Reynolds	Reynolds	\$8,369,044.78
I-70 Community Hospital	Saline	\$9,670,358.90
Parkland Health Center- Bonne Terre	St. Francois	\$7,055,044.51
Sullivan County Memorial Hospital	Sullivan	\$51,250,205.99
Washington County Memorial Hospital	Washington	\$43,425,674.83

Calculating the Economic Impact of Missouri CAHs⁴

- To determine the economic impact of CAHs on rural communities, an analysis of the direct economic contribution of the operating activities (CAHs) was conducted, as well as measuring how many jobs and how much income was generated as secondary impacts of CAH operations (indirect effects).
- The direct economic impact was measured by calculating individual CAH employment and payroll (wages and salaries plus benefits), including proprietor income.
- The indirect economic impact was calculated using employment and income multipliers.
- Multipliers are derived through IMPLAN analyses which have the capability to capture many cycles of re-spending in an economy.
- The induced impact is the change in local spending amount due to the direct and indirect effects. Money is recirculated through household spending patterns (re-spending of income) to generate further economic activity.
- The sum of direct, indirect, and induced effects equals the total economic impact of change in the local economy.
- Figure 8 is a diagram illustrating direct, indirect, and induced activity.



Labor and Income Impact³

- Due to the large number of CAHs measured, results are displayed as averages and ranges.
- Labor and income impact is the measure of the impact on personal incomes, not business revenues or profits.
- Of the average amount of employees for all 32 CAHs, an average of over \$14 million is generated in direct wages, salaries, and benefits. Lincoln County had the highest amount of direct payroll generated at over \$31 million.
- On average an additional \$6,000 in payroll was generated indirectly (in other sectors of the community). Livingston County had the highest impact at \$28,002.05.
- The change in local spending (induced effect) was an average of \$102,751 between the 32 counties with obtainable data.
- The total average impact was over \$14.5 million dollars of generated payroll due to the direct and indirect wages, salaries, and benefits of Missouri CAH. Lincoln county had the highest total impact overall. (Figure 9).

Figure 9. Results for Labor and Income³



Total Value Added Impacts³

- Total value added consists of employee compensation, taxes, and operational costs, and is the difference between an industry's total output and the cost of its inputs (Figure 10).
- Total value added is the measure of the increase in local employee wages and local business profits, as opposed to labor and income impacts which does not measure business revenue.
- The average total direct value added was slightly over \$17 million.
- The average indirect value added was \$8,604.30.
- The Induced average for the 32 counties was \$130,599; Livingston County had the highest indirect and induced impacts.
- The total impact was over \$17 million with a range from \$3,491,968 to \$36,857,049; Lincoln County had the highest direct added value and total value.

Figure 10. Results for Total Value Added³

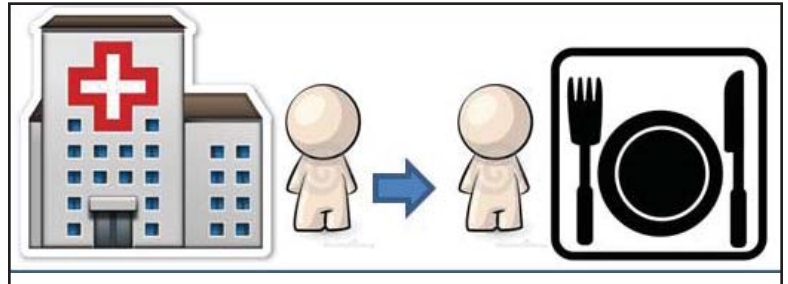


Missouri CAH Multipliers and Impacts

- Multipliers are numeric summaries generated from the Input/Output model that indicate the change in economic activity due to a one-unit direct change.⁴
- A Type SAM Multiplier (Social Accounting Matrix) was used to calculate employment and income impacts. Type SAM Multipliers capture the effects of direct, indirect, and induced impacts while accounting for commuting, social security, income taxes, and household savings.⁴

Figure 11. Diagram of Indirect Employment³

- ▶ The average Type SAM Multiplier for employment is 1.5. This means that for every job that is created at a CAH, 0.5 jobs are created in another industry in that county.³ (Figure 11)



**Figure 11 uses a restaurant symbol to represent all indirect industries*

Figure 12. Diagram of Indirect Income³

- ▶ The average Type SAM Multiplier for income is 1.26, meaning for every \$1.00 generated by the CAH, \$0.26 is generated in other industries in the economy.³ (Figure 12)



Missouri Critical Access Hospitals Used to Obtain Data for this Report²

Critical Access Hospital	County	Population	Employee Count
Community Hospital-Fairfax	Atchison	5,382	107
Cox Monet & Mercy Hospital Cassville	Barry	35,662	378
Barton County Memorial Hospital	Barton	12,057	192
Carroll County Memorial Hospital	Carroll	9,043	180
Cass Regional Medical Center	Cass	100,889	462
Cedar County Memorial Hospital	Cedar	13,952	124
Excelsior Springs Hospital	Clay	233,682	277
Missouri Baptist Sullivan Hospital	Crawford	24,650	383
Salem Memorial District Hospital	Dent	15,655	185
Hermann Area District Hospital	Gasconade	14,866	212
Northwest Medical Center	Gentry	6,826	178
Wright Memorial Hospital	Grundy	10,197	188
Harrison County Community Hospital	Harrison	8,639	207
Mercy St. Francis Hospital	Howell	40,173	114
Lafayette Regional Health Center	Lafayette	32,688	240
Mercy Hospital Aurora	Lawrence	38,023	162
Mercy Hospital Lincoln	Lincoln	54,249	306
Pershing Memorial Hospital	Linn	12,311	173
Hedrick Medical Center	Livingston	15,053	312
Samaritan Hospital	Macon	15,479	238
Madison Medical Center	Madison	12,368	286
Freeman Neosho Hospital	Newton	58,598	233
Perry County Memorial Hospital	Perry	19,202	345
Pike County Memorial Hospital	Pike	18,541	184
Southeast Health Center of Reynolds	Reynolds	6,565	64
I-70 Community Hospital	Saline	65,960	79
Parkland Health Center- Bonne Terre	St. Francois	23,347	54
Sullivan County Memorial Hospital	Sullivan	6,411	85
Washington County Memorial Hospital	Washington	25,077	262

Missouri CAHs that did not have obtainable data through the IMPLAN software for this report are Ste. Genevieve County Memorial Hospital, Scotland County Memorial Hospital, Putnam County Memorial Hospital, Iron County Memorial Hospital, Mercy Hospital Carthage in Jasper County and Ellet Memorial Hospital in St. Clair County.²

In Conclusion

It is evident through this analysis that CAHs generate economic activity throughout rural Missouri. CAHs play a key role in the economic stability of a community and the closing of a CAH has the potential to negatively effect not only health care in the community, but the economy as a whole. For more information on individual county economic impacts, please contact the Department of Health and Senior Services, Office of Primary Care and Rural Health.

Sources

1. Centers for Medicare & Medicaid Services. Critical Access Hospitals. Accessed February 22, 2016 at <https://www.cms.gov/medicare/provider-enrollment-and-certification/certificationandcompliance/cahs.html>.
2. Critical Access Hospitals in Missouri. Accessed February 6, 2016 at <http://health.mo.gov/safety/healthservregs/pdf/CAHhosp.pdf>.
3. IMPLAN Online. Minnesota IMPLAN Group, Inc., Stillwater, Minnesota. Accessed December 11, 2015 at <http://www.implan.com/>.
4. IMPLAN. The controlled vocabulary of IMPLAN-specific terms. Accessed February 3, 2016 at https://implan.com/index.php?option=com_glossary&task=list&letter=.
5. National Center for Rural Health Works. Economic Impact of Rural Health Care. Accessed February 4, 2016 at <http://ruralhealthworks.org/wp-content/files/Economic-Impact-of-Rural-Health-for-NOSORH-for-Natl-Rural-Hlth-Day.pdf>.
6. Rural Health Information Hub. Community Vitality and Rural Healthcare. Accessed February 19, 2016 at <https://www.ruralhealthinfo.org/topics/community-vitality-and-rural-healthcare>.
7. Rural Health Information Hub. Critical Access Hospitals (CAHs) News. The Rural Hospital Closure Crisis: 15 Key Findings and Trends. Accessed February 22, 2016 at <https://www.ruralhealthinfo.org/topics/critical-access-hospitals/news>.
8. Rural Health Information Hub. Missouri Rural Health Care Facilities. Accessed February 19, 2016 at <https://www.ruralhealthinfo.org/states/missouri>.
9. Southeast Missourian. Southeast HEALTH closing Reynolds County health center, clinics. Accessed February 11, 2016 at <http://www.semissourian.com/story/2275814.html>.
10. U.S. Government Publishing Office. Regulatory Information. 42 CFR 485.610- Condition of Participation: Status and Location. Accessed February 5, 2016 at <https://www.gpo.gov/fdsys/granule/CFR-2011-title42-vol5/CFR-2011-title42-vol5-sec485-610>.



Missouri Department of Health and Senior Services
Office of Primary Care and Rural Health
P. O. Box 570
Jefferson City, MO 65102-0570
573.751.6219
health.mo.gov

Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health and Senior Services, Office of Primary Care and Rural Health, P.O. Box 570, Jefferson City, MO 65102, 573.751.6219.

Hearing- and speech-impaired citizens can dial 711.

AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER

Services provided on a nondiscriminatory basis.